

SOV/80-32-4-10/47

Methods for Preparing Aluminum Hydroxide and the Deformation-Resistant Properties of Its Pastes in Vaseline Oil

their humidity. The transparency of the pastes changes directly with the content of the SO_4 -groups in the deposit and reaches a maximum at $pH = 5.3$. The hydroxide pastes in vaseline oil have no elastic aftereffect and behave like elastic-brittle bodies. Figurovskiy is mentioned in the text.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry AS USSR)

SUBMITTED: January 27, 1958.

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SOV/76-33-7-27/40

5(4)

AUTHORS:

Trapeznikov, A. A., Tolmachev, A. M.

TITLE:

On the Problem of the Formation of Aluminum Hydroxide

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 7,
pp 1632 - 1637 (USSR)

ABSTRACT:

The authors investigated the influence exerted by the pH and other factors during the formation of aluminum hydroxide (I) upon its capability of thickening and several other properties of the produced (I) since it is used for polarographic colors. For this reason, investigations were for the major part carried out with solutions of potassium-aluminum alum (II) and sodium carbonate, and NaOH solutions were used only for the purpose of rendering reaction conditions less complicated. Titration was carried out potentiometrically with 0.5 n (0.4994 n) (II)-solutions, 0.5 n (0.4910 n) $AlCl_3$ solutions and NaOH solutions of various concentrations by means of glass electrodes (PPTV-1 potentiometer). The precipitate of (I) was dried at 105°C and analyzed with respect to its SO_4^{2-} content (Table). The aging of the precipitate in solutions with different pH resulted in a complicated change in the

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On the Problem of the Formation of Aluminum Hydroxide SOV/76-33-7-27/40

course of the titration curve. At a ratio of $3.0 \text{ OH/Al} < 4.0$, the pH slightly falls in the first two hours, and then rises sharply (which is ascribed to reduced solubility of the precipitate as a consequence of aging) and remains constant. At $\text{OH/Al} < 3.0$, the pH decreases in the course of time, and the titration curve attains a maximum and minimum (which is explained by two processes, i. e. 1) successive transformation of the crystal structure of (I), and 2) transition of basic aluminum salts into (I). In acid solutions ($\text{pH} = 4.0 - 4.5$), the pH almost does not change in the course of time. The most complete precipitation of aluminum from 0.5 n (II)-solutions with 0.5 n sodium carbonate solution takes place at $\text{pH} = 5.0 - 5.3$. There are 2 figures, 1 table, and 18 references, 4 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii, Moskva (Academy of Sciences of the USSR, Institute of Physical Chemistry, Moscow)

SUBMITTED: January 18, 1958 .

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5 (4)

AUTHORS:

Trapeznikov, A. A.; Zotova, K. V.

SOV/20-128-2-32/59

TITLE:

The Formation of Thixotropic Structure in an OT Aerosol-sucrose Solution and in Bilateral Films Formed by It, and the Effect of This Structure on the Stability of Foams

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 2, pp 337-340 (USSR)

ABSTRACT:

The viscosity and elasticity of bilateral films (shortly called film in the following) was investigated by means of the method of horizontal concentric rings as described in reference 2. The aerosol OT used (dioctylester of sulfosuccinic acid) forms stable films. To study the effect of the sucrose, which is used to raise the stability of foams, OT-solutions (0.045 mol/l) were treated with 1.4 mol/l of sucrose. The results show (Table 1) that the property of the film greatly depends on an aging process. In newly prepared solutions no effect of sucrose on the viscosity is noticed, whereas viscosity increases by 300 times in about 100 days. If the measurement of the film property of an aged solution is repeated several times, the viscosity of the film decreases to the original amount of the fresh solution (Table 2). This was also confirmed by direct measurement of the solution viscosity (Table 3). After some

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rest of the film viscosity increases again (Table 4). A similar fact was observed when investigating foam stability. Whereas foams produced by careful stirring proved a stability depending on the age of the solution, the foam of a violently stirred solution collapses as fast as the foam of a newly prepared solution (Fig 1). Therefore a thixotropic structure of the solution mixed with sucrose is assumed, which is again destroyed by mechanical action. The stabilization of the foam and the film of an aged solution is reached by retarding the outflow of the fluid from the film. Therefore the films of aged solutions are colorless and about 1μ thick, while films with disturbed structure become thin quickly and show interference colors. There are 1 figure, 4 tables, and 4 references, 3 of which are Soviet.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of
Physical Chemistry of the Academy of Sciences, USSR)

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TRAPETIKOV, A.A.

Report presented at the 1st All-Union Congress of Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb '60.

268. L. M. Sverdlov (Mukhlakov): Strain design and general stability of structures.
269. L. M. Sverdlov (Mukhlakov): A general method of solving non-linear problems of structural mechanics.
270. S. D. Repyev (Moscow): A contribution to the non-linear problem of plate flutter.
271. L. O. Stepanovskii, E. F. Zhukov (Moscow): On the use of variational principles for the approximate solution of some problems of plastic equilibrium.
272. A. I. Strizhinskii (Moscow): Experimental investigation of the oblique bending of steel beams beyond the elastic limit.
273. A. A. Stroganov (Moscow): Strength and visco-plastic flow of soils.
274. S. I. Khodashevskii (Moscow): The relation between pore pressure and rate of creep of alloys.
275. L. A. Kulakovskii (Tula): Finite plastic strains of non-linearly deformed bodies.
276. J. B. Zaslavskii (Moscow): Fitting of metals by a spherical punch considering contact friction.
277. L. M. Verbitskii (Moscow): An asymptotic method of calculating the stability limit of a variable pitch at high speeds of rotation.
278. E. E. Smor (Moscow): Application of similarity methods to the analysis of the flow of rubber compounds.
279. A. G. Zhuravskii, E. O. Rudakovskii (Moscow): Dependence of the maximum elastic and discontinuous strains of aluminum-magnesium pipe on strain rate.
280. E. A. Zhuravskii (Moscow): An asymptotic method for the design of toroidal shells.
281. V. E. Turin (Moscow): Some problems of soil dynamics.
282. E. I. Zhitko (Gosplan): The flow in the boundary layer of an elastic, visco-plastic medium.
283. A. O. Budnikov (Gosplan): Some problems concerning the analysis of stresses in armor plate.
284. S. K. Murat (Moscow): On strength and rupture criteria for metals in the presence of stress concentrations.
285. J. I. Mikheev (Kiev): Some problems of non-linear creep.
286. A. A. Zhuravskii (Moscow): Elastic and metal models in the analysis of structural mechanisms concerning bars and thin-walled structures.
287. M. I. Gerasimov (Khabarovsk): The problem of seismic strength of fluid supercavitic structures.
288. L. S. Vasiliev (Leningrad): Application of integral transformations to the solution of some problems concerning an elastic wedge.
289. L. S. Vasiliev (Moscow): Deformations of plastic slabs in bending.
290. I. V. Zolotarev (Moscow): Elastic-plastic equilibrium of an axisymmetric body.
291. A. A. Zhuravskii (Moscow): Stability and vibrations of orthotropic plates of variable thickness.
292. A. P. Zhuravskii (Khabarovsk): Extensional vibrations of turbine blades.
293. M. M. Vlasovskii (Moscow): On the possibility of stabilizing the Kármán and Euler-Hess-Schubert theories of flutter.
294. E. I. Zaslavskii (Moscow): Some problems concerning the bending of plates and shells with stiffeners.
295. L. M. Vasiliev (Moscow): On the impact of a wave on a heavy rigid rubber embedded in an elastic medium.
296. V. A. Zolotarev (Leningrad): Some problems concerning rock formations of hydraulic structures.
297. V. A. Zolotarev (Leningrad): Present state and problems of soil mechanics.
298. V. A. Zolotarev (Leningrad): Flow conditions for activated media.
299. E. I. Zaslavskii (Leningrad): Experimental study of soil and apparent friction in vibrating systems.
300. E. I. Zaslavskii, E. M. Zhukovskii (Moscow): On the construction of Green's functions for the equilibrium problem of shallow shells.
301. E. I. Zaslavskii (Khabarovsk): Further development of the initial boundary conditions.
302. E. M. Zhukovskii (Moscow): Temperature stresses in multilayer plates and their effect on flutter.

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S/030/60/000/06/06/043
B004/B008

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AUTHOR: Trapeznikov, A. A., Doctor of Chemical Sciences
TITLE: New Rheological Apparatus and Methods of Studying Colloidal
Systems and Polymeric Solutions
PERIODICAL: Vestnik Akademii nauk SSSR, 1960, No. 6, pp. 70-80

TEXT: In the introduction, the author gives a survey of the methods of studying the rheological properties of various colloidal systems such as pastes, suspensions, emulsions, gels, gelatins, and structural solutions. He then describes the multipurpose elastoviscosimeter (Fig. 1) developed by him in 1947-1948 which permits the simultaneous determination of various characteristic values. Fig. 2 shows measurements of the function $P(\epsilon)$ for various colloids; it is pointed out that the initial section of the curve is very characteristic of the various colloidal systems, and permits conclusions as to their structure. Fig. 3 shows the $P(\epsilon)$ curves for rubber solutions. Their form is conditioned by the different relaxability of the systems investigated. The author explains the conditions under which a maximum P_r or a flat course of the $P(\epsilon)$ curve

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occurs, as a combined action of a system of Maxwell bodies with different critical deformations and different relaxation times. The phenomena of thixotropy are dealt with and divided into strength thixotropy and viscosity thixotropy (Fig. 4). Hysteresis loops could be determined by means of the author's investigation method. The elastorelaxometer (Fig. 5) developed by the author is described. A cylinder is turned by an angle at constant speed, braked, and disconnected from the drive shaft by means of an electromagnetic clutch, so that its further movement takes place only under the influence of the elastic forces of the system. The rotary impulses can be varied between 30 and 1000 sec⁻¹. The P(ϵ) curve is simultaneously recorded by an oscilloscope. Fig. 6 shows the influence of temperature on the reversible (resilient) deformation and the strength of the structure of rubber solutions. Elasticity increases with decreasing temperature. The superiority of this method over the purely viscosimetric methods is pointed out finally. There are 6 figures and 16 references: 10 Soviet, 2 French, 2 German, 1 International, and 1 American.

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TRAPEZNIKOV, A.A.; ZOTOVA, K.V.

Changes in the damping decrement and oscillation period of a torsion pendulum in two-sided soap films during their thinning up to rupture.
Koll. zhur. 22 no.4:42-488 J1-Ag '60. (MIRA 13:9)

1. Institut fizicheskoy khimii AN SSSR, Laboratoriya oleokolloidov
i monosloyev, Moskva.
(Soap) (Films (Chemistry))

87767

S/069/60/022/006/004/008
B013/B066

11.2314 also 2915

AUTHORS: Shalopalkina, T. G. and Trapeznikov, A. A.

TITLE: Dependence of Ultimate Highly Elastic and Rupture Deformation
on the Deformation Rate of the Gel Solution of Aluminum
Naphthenate

PERIODICAL: Kolloidnyy zhurnal, 1960, Vol. 22, No. 6, pp. 735-742

TEXT: The present paper was presented in 1960 at the All-Union Congress of Mechanics in the Subsection of Rheology. It deals with the study of the dependences $\epsilon_e(\dot{\epsilon})$ and $P(\dot{\epsilon})$ as well as $\epsilon_{e \max}(\dot{\epsilon})$ and $\epsilon_r(\dot{\epsilon})$ in a range of $\dot{\epsilon}$ as broad as possible for aluminum naphthenate gel. (ϵ_e = highly elastic deformation, ϵ_r = rupture deformation, $\dot{\epsilon}$ = deformation rate). A 2% gel solution of aluminum naphthenate in non-polar medical vaseline oil was used. The study was carried out on the elasto-relaxometer (model 2) (Ref. 5). An elasto-viscosimeter (model 3) was used for the range of high $\dot{\epsilon}$ (from 35 - 1100 sec⁻¹) and for the range of low $\dot{\epsilon}$ (from 0.46-46 sec⁻¹)

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Dependence of Ultimate Highly Elastic and
Rupture Deformation on the Deformation Rate
of the Gel Solution of Aluminum Naphthionate

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(Ref. 6). In order to record $\epsilon_e(\dot{\epsilon})$ curves, an automatic special device was constructed for the latter apparatus. The elastic deformation in the range of 0.46-45.8 sec⁻¹ was found to increase rapidly at any given deformation. The increase of $\dot{\epsilon}$ in the range of 37.45-1112 sec⁻¹ shows an opposite result: with increasing deformation rate the maximum elastic deformation which is possible at the corresponding rate, decreases. This means that the elastic deformation at a considerable increase of $\dot{\epsilon}$ has not time enough to develop completely. It may be seen from the $P(\dot{\epsilon})$ curves recorded at the same time with $\epsilon_e(\dot{\epsilon})$ curves, that the P-values rapidly increase with increasing $\dot{\epsilon}$, the ϵ_r values, however, decrease, accordingly (Ref. 6). The maxima observed in the $P(\dot{\epsilon})$ and $\epsilon_e(\dot{\epsilon})$ curves characterize different stages of structure destruction during the deformation of the system at $\dot{\epsilon} = \text{const}$. Fig. 4 gives the changes of $\epsilon_{e \text{ max}}$, ϵ_m and ϵ_r as a function of $\dot{\epsilon}$ in logarithmic coordinates. Their correlation may be seen from $\epsilon_{e \text{ max}}$ and ϵ_m as well as from the similarity of their change. They

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Dependence of Ultimate Highly Elastic and
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are found to determine the limit of elasticity of the system and the deformation at any $\dot{\epsilon}$. It results from Fig. 4 that ϵ_r may be both larger and smaller than ϵ_m for one and the same system. The elastic deformation was found to develop first during the deformation process. Plastic deformation occurs later, owing to gradual destruction of short structural elements. The considerable increase of P_r in the range of $\dot{\epsilon}$ which corresponds to the descending branch of the $\epsilon_m(\dot{\epsilon})$ or $\epsilon_{e \max}(\dot{\epsilon})$ curve (Fig. 4), is related to the increasing number of nodes and interlacings of the network. This is the result of a hindered stretching of chain-shaped particles and of their rupture in a highly coiled state. A reduction of the rupture deformation is equivalent to the formation of a denser structure. It was found from the dependence of the quantity ϵ_e on the relaxation time of the system (Fig. 5) for each of the $\dot{\epsilon}$ studied that the time of thixotropic restoration of structure becomes shorter with increasing $\dot{\epsilon}$. This was explained by the fact that in this connection only the mobile

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and quickly relaxing structural elements are preserved which form the structure (Table 1). $P(\epsilon_e)$ curves for different ϵ were plotted on the basis of the data obtained (Fig. 6). They indicate the occurrence of the following ranges of deformation (Table 2): a) initial deformation with a high shear modulus which corresponds to an "elastic" deformation; b) medium range with a comparatively very low shear modulus which corresponds to the highly elastic deformation; c) end range with an increased modulus which corresponds to a highly elastic deformation of a reinforced structure. The one or the other type of deformation may prevail, according to ϵ . There are 6 figures, 2 tables, and 8 Soviet references.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR, Moskva (Institute of Physical Chemistry AS USSR, Moscow)

SUBMITTED: March 11, 1960

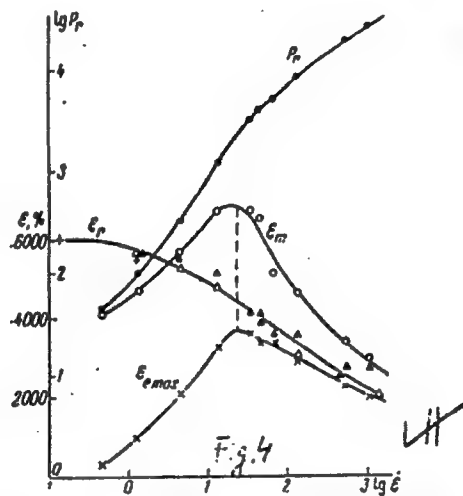
Legend to Fig. 4: ϵ_e = elastic deformation, ϵ_m = deformation in which

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$\epsilon_{e \max}$ is attained, ϵ_r = rupture deformation; P_r = shearing strength of the structure; $\dot{\epsilon}$ = deformation rate.
Legend to Fig. 6: a) = dyne/cm², b = sec⁻¹



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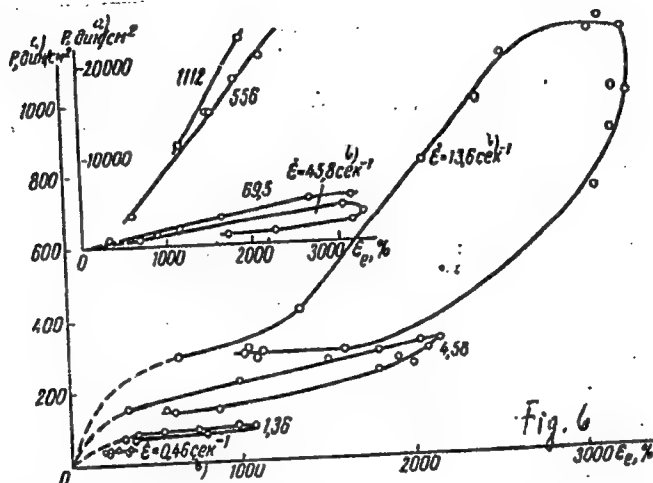


Fig. 6

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TRAPZNIKOV, A.A.; MOROZOV, A.S.; PETZHIK, G.G.

Normal stresses in structurized colloidal systems, and the
effect of the thixotropic recovery of structure on them.
Koll. zhur. 22 no. 6:761-762 N-D '60. (MIRA 13:12)

1. Institut fizicheskoy khimii AN SSSR, Moskva Laboratoriya
oleokolloidov i monosloyev.
(Colloids)

TRAPEZNIKOV, A.A., doktor khim.nauk

New rheological apparatus and methods for studying colloidal
systems and solutions of polymers. Vestnik SSSR 30 no.6:
70-80 Je '60. (MIRA 13:6)
(Rheology) (Colloids)

ZOTOVA, K.V.; TRAPEZNIKOV, A.A. (Moscow)

Application of the plate equilibrating (Wilhelmy) method to the study of the surface tension of solutions of semicolloidal substances when the equilibrium is reached slowly. Zhur.fiz.khim. 34 no.1:200-208 Ja '60. (MIRA 13:5)
(Surface tension) (Colloids)

S/020/60/133/003/030/031/XX
B004/B064

AUTHORS: Trapeznikov, A. A., Morozov, A. S., and Petrzhik, G. G.

TITLE: The Dependence of Normal and Shearing Stresses on the Extent
of Deformation During the Transition of the Aluminum
Naphthenate Gel From the State of Rest Into Steady Flow

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 3,
pp. 637 - 640

TEXT: The authors aimed at a quantitative determination of the development in time of normal stress as a function of deformation during a continuous transition from the state of rest into steady flow. The experiments were conducted with a 2% solution of aluminum naphthenate gel in Vaseline oil. To render possible a simultaneous measurement of normal stress P_n and shearing stress P_τ , a rheogeniometric apparatus supplementing the plasto-viscosimeter was designed (Fig. 1). In principle, it consisted of a flat cone combined with a disk. The perpendicular displacement of the disk under the action of the normal force F_n and its rotation under the action of the

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The Dependence of the Normal and Shearing
Stresses on the Extent of Deformation During
the Transition of the Aluminum Naphthenate Gel
From the State of Rest Into Steady Flow

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torque of the tangential force F_{τ} were measured with a spring dynamometer and recorded with an electronic potentiometer of the type ЭПМ-09²⁸ (EPP-09) or an МПО-2²⁸ (MPO-2) loop oscilloscope. Fig. 2 shows P_n and P_{τ} as a function of deformation, ϵ , at various rates of deformation. The viscosity determined from $\eta = P_{\tau s} \dot{\epsilon}$ (the subscript s denotes steady flow), falls, as a rule, with rising $\dot{\epsilon}$ (Fig. 3). Fig. 2 indicates that P_n and P_{τ} have a maximum.

T. G. Shalopalkina and A. A. Trapeznikov obtained the same result in 1955, as may be seen from Fig. 4. The experimental data show that at $\epsilon > 1700$ the structure of the system undergoes changes exerting a stronger effect on normal stress than on tangential stress. The normal stress depends on the entanglement of the particles. The longer and the more entangled they are, the greater is F_n in the stress. The second maximum P_{n2} and $P_{\tau2}$ is due to the destruction of structural elements that, after the destruction of the initial network, were formed by orientation in the flow. There are 4 figures

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The Dependence of the Normal and Shearing
Stresses on the Extent of Deformation During
the Transition of the Aluminum Naphthenate Gel
From the State of Rest Into Steady Flow

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and 13 references: 7 Soviet, 5 US, 3 British, 1 Dutch, and 5 German.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR
(Institute of Physical Chemistry of the Academy of Sciences
USSR)

PRESENTED: March 24, 1960 by S. I. Vol'fkovich, Academician

SUBMITTED: March 18, 1960

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S/190/61/003/001/016/020
B119/B216

AUTHORS: Zatsepina, T. I., Trapeznikov, A. A.

TITLE: Strength, deformation and viscosity of solutions of acrylonitrile rubber in toluene-decalin at increased deformation rate

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 1, 1961, 113-121

TEXT: The present study was undertaken with a view to explaining the influence of solvents on the structure and characteristic properties of polymer solutions. Measurements were carried out on 10% solutions of CKH-18 (SKN-18) acrylonitrile rubber (component ratio of acrylonitrile: divinyl = 18:82) in various mixtures of toluene - decalin as well as in the pure solvents. A strain gage described in (Ref. 8) was used for the measurements. Elastic elongation, ϵ_e , and stress, P , were calculated by a method also given in Ref. 8. The tests were performed at strain rates ranging from 36 to 1100 sec^{-1} . Shear strength, elongation at rupture and reversible elongation were determined. With toluene, SKN-18 forms solutions

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of low structure and low elasticity (maximum elastic elongation 500%), strength, viscosity and low relaxation times. The presence of decalin in the solvent leads to structure formation (as a result of intermolecular interaction), causing an increase of elasticity (elastic elongation is 1400% in a solvent mixture containing 50% decalin), strength, viscosity and relaxation times. Maximum values for the above properties were obtained in a 50% decalin solvent mixture. At higher percentages of decalin the results are less favorable owing to microcoagulation. The solutions under study were of thixotropic strength. The time of thixotropic recovery increases with the content of decalin. There are 9 figures, 3 tables, and 11 references: 10 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry AS USSR)

SUBMITTED: June 12, 1960

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S/190/61/003/006/003/019
B110/R216

AUTHOR: Trapeznikov, A. A.

TITLE: Influence of temperature on maximum elastic deformation and structure strength of rubber solutions

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 6, 1961, 811-819

TEXT: The present study deals with the temperature dependence of maximum elastic deformation and strength of a 2 % natural rubber (pale crepe) solution purified chromatographically and over silica gel in Dekalin. The following questions were studied: 1) structure of the solution and influence of intermolecular interaction on its elasticity and strength; 2) relationship between these properties and the influence of temperature and crystallization on rubber deformation in the block; 3) the absolute maximum elastic deformation of rubber solutions; 4) correlation between elastic strength properties and the viscosity anomaly of rubber solutions. The $P(t)$ and $t_p(E)$ curves were determined in the elastorelaxometer type 2

(Ref. 1: A. A. Trapeznikov: Priboiy : tekhnika eksperimenta, 1958, No 3,

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93) at a deformation rate $\dot{\epsilon} = 143 \text{ sec}^{-1}$ and 90°C to -35°C . The elastic deformation, its peak value $\epsilon_{e \text{ max}}$ and the given deformation at which $\epsilon_{e \text{ max}}$ is reached are highly temperature dependent (Fig. 1). The temperature conditions used for cooling and heating the solution ($t < 30^\circ\text{C}$) have a marked influence on its properties. Cooled and reheated solutions (Fig. 3) retain partly the properties acquired on cooling. Heating of the solutions to $30-80^\circ\text{C}$ changes their properties. Fig. 4 represents $\epsilon_e(\epsilon)$ plots for secondary cooling. Heating of the systems shifts all the properties of the solution towards the higher temperature side. Based on the theory of polymer structure, flexibility and length of the molecules and lattice chains, the authors measured the maximum (reversible) elastic deformation along the stress-deformation curves in flowing solutions and polymer gels. For natural rubber, the maximum deformation was found at 1000-1200 %. Rubber solutions showed elastic shift deformations of up to 6700 %. The maximum elongation deformation is proportional to the square root of the number of molecular units in a chain. On solution of the polymer, the number of these molecular units and the maximum elastic

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elongation increase as a result of a decrease in the number of nodes. At high dilution, however, the nodes required for the fixing and elongation of the chains disappear, thus allowing the chains to slip past one another and as a result, the elastic deformation drops. This implies the existence of a maximum at comparatively low polymer concentration such as, e.g., in the case of aluminum naphthenate. The experimental difference between elastic and breaking deformation of rubber solutions (2 % solution at -25°C: $\epsilon_{e \max} = 67$, $\epsilon_r = 150$) $\epsilon_r - \epsilon_e = \epsilon_v$ is the irreversible plastic deformation of a solid before rupture. The chain length responsible for maximum elastic deformation relates to 2 or more molecules linked by nodes. Since a network cross-linked by nodes is built up during elastic deformation, and $\epsilon_{e \max}$ and ϵ_m increase sharply with a drop in temperature, it follows that this increase must be due to an increase in the number of nodes. Accordingly, the crystallization rate of rubber is highest at -25°C. At very low temperatures it becomes vitreous and loses its high elasticity. Presumably, local crystallization and packet formation, not affecting chain flexibility, also occur at very low temperatures in the rubber solution. The exponential dependence of $\epsilon_{e \max}$, ϵ_m and P_r on the

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temperature is probably correlated with the exponential dependence of the number of nodes on the temperature. Deviations at the breaks in the curves show that each parameter is based on an individual set of structural elements. The stress is due to the hardness accompanying highly developed crystallization. It follows from the shape of the curves of $\log \xi_{e \max} = f(1/T)$ and $\log \xi_m = f(1/T)$ that the formation of nodes possessing crystalline character is an equilibrium reaction at all temperatures, even at $t > 20^\circ\text{C}$. The first sharp slope of P in the $P(\xi_e)$ curve is due to the initial closely coiled structure involving a large number of short chains. This causes the high initial shift modulus. The first peak indicates cleavage of these bonds. The second rise of P is due to the stretching of chains connected by nodes formed during crystallization. The second peak $P = P_r$ corresponds to the destruction of these nodes. The second part of the $P(\xi_e)$ curve (Fig. 5) is given by $E_{el} = dP/d\xi_e = (P - P_{\text{area}})/(\xi_e - \xi_{e \text{ area}})$, where P_{area} and $\xi_{e \text{ area}}$ denote the stress and elastic deformation at the end of the

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areas. According to the $P(\epsilon)$ curves, the deformation work is $A = \int_0^{\epsilon_e} P(\epsilon) d\epsilon$.

At P_r , this is the work required for the destruction of structure and for particle orientation. $A_e = \int_0^{\epsilon_e} P(\epsilon_e) d\epsilon_e$ gives the reserve energy of the unit volume or the elastic potential of the system. Thus ϵ_e and particularly $\epsilon_{e \max}$ are very sensitive to formation and destruction of structure. The author thanks L. S. Meshcheryakova for performing the measurements. There are 6 figures and 9 Soviet-bloc references.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry AS USSR)

SUBMITTED: July 19, 1960

Fig. 1: The $\epsilon_e(\epsilon)$ (a) and $P(\epsilon)$ (b) curves in the temperature range $+70^\circ\text{C}$ to -35°C . (For Fig. 1 see cards 9/10 and 10/10.)

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TRAPEZNIKOV, A.A.; OGAREV, V.A.

Structure and properties of the monomolecular layers formed
by polyesters of phosphinic acids and hydroquinone. Vysokom.
soed. 3 no.11:1708-1715 N '61. (MIRA 14:11)

1. Institut fizicheskoy khimii AN SSSR.
(Phosphinic acid) (Hydroquinone) (Esters)

40968

S/081/62/000/016/035/043
B171/B186

15.8111

AUTHORS: Trapeznikov, A. A., Shalopalkina, T. G., Amfiteatrova, T. A.

TITLE: Rheological and thixotropical properties of dispersions of alkyd resins modified by polyamid resins

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 16, 1962, 546, abstract 16P246 (Lakokrasochn. materialy i ikh primeneniye, no. 5, 1961, 3 - 10)

TEXT: The rheological and thixotropical properties of alkyd polyamid resin (APR) (alkyd resin modified by polyamid resin) dispersions in white spirit were investigated over large ranges of deformation velocities ($5 \cdot 10^{-3}$ - $5 \cdot 10^2$ sec⁻¹), of resin concentrations (30 - 90%), and of temperature, using a complex elasto-viscosimeter, which made it possible to reproduce the actual conditions under which APR-based paints are used. It has been established that the systems under investigation show clearly defined strength and thixotropies of viscosity. In particular, it has been shown that the viscous structure of the paint can be re-established

Card 1/2

Rheological and thixotropical...

S/081/62/000/016/035/043
B171/B186

by a low gradient flow after having been destroyed at a high velocity gradient. The characteristics of APR dispersions at early stages of their structure being re-established, are due to the viscous thixotropy, whereas after a long period of rest they are conditioned by strength and thixotropies of viscosity. It has been shown that the stability of structure and the viscosity quickly increase (following the exponential law) with the increase of the resin concentration, so that the running-off of the paint during its application is substantially changed. Data for deformation and rupture lead to the conclusion that the particles of APR are relatively compact and that the system has the character of a concentrated suspension. The effect of rheological and thixotropical properties of APR on the process of film formation and on the stability of pigment-containing systems has been investigated. [Abstracter's note: Complete translation.]

Card 2/2

S/069/61/023/001/009/009
B124/204

AUTHOR: Trapeznikov, A. A.

TITLE: Normal stresses in a polyisobutylene solution from data on elastic deformation and tangential stress

PERIODICAL: Kolloidnyy zhurnal, v. 23, no. 1, 1961, 125-127

TEXT: In earlier papers (Refs. 3-5) the normal stress P_n was calculated from the equation $P_n = P_t \xi_e = E \xi_e^2$, where P_t denotes the tangential stress, ξ_e the elastic deformation, and E the shear modulus. In previous work (Ref. 6) the author attempted to measure directly the elastic deformation which at high deformation rates, $\dot{\xi} = \text{const}$, is a characteristic parameter of the deformability of the structural lattice and of the chain length. For the purpose of obtaining data concerning the functions $\xi_e(\dot{\xi})$ and $P_t(\dot{\xi})$ during transition from the state of rest ($\dot{\xi} = 0$) to the steady flow state ($\dot{\xi} \rightarrow \infty$), the author examined solutions of polyisobutylene in ortho-xylene with the help of an elasto-relaxometer (Ref. 6) which was adjusted

Card 1/4

S/069/61/023/001/009/009
B124/204

Normal stresses in a ...

for measurements of ξ_e at an ξ of up to 2000. From the measured values of ξ_e and P_r , the normal stresses $P_n(\xi)$ were calculated for the entire range between $\xi = 0$ and $\xi \rightarrow \infty$. A figure shows that the curves $\xi_e(\xi)$ and $P(\xi)$ pass through maxima at $\xi = \xi_m$ and $\xi = \xi_{tr}$, respectively, which do not coincide. Therein $\xi_{e \max} > \xi_{tr}$, which is explained by the action of the

assembly of structural elements. The curves indicate that the calculated value of P_n is particularly high in the initial and transitional stages of deformation. One may therefore regard $(P_{nr})_\xi$ as a new characteristic of the system. The correctness of the obtained P_n values had to be checked by experiments. It can be seen from the curve $E = P_r/\xi_e = f(\xi)$ in the figure that E is not constant. E_s increases with ξ for the steady state as a consequence of decreasing ξ_{es} in the case of enhanced structural breakdown, whereas ξ_{max} further increases with ξ . This is proved by the hypothesis (Ref. 8) on the passage of ξ_{es} through a maximum when ξ rises. In connection herewith, E in the equation for P_n assumes the meaning of an effective "structural" modulus. The essential deviation of the curves

Card 2/4

Normal stresses in a ...

S/069/61/023/001/009/009
B124/204

$P_r(\xi)$ and $\xi_0(\xi)$ in the figure after the maximum P_{rr} does not exclude the possibility of a different orientation of the stress and deformation ellipsoids in this range of ξ . From this one may conclude that a perfect agreement of experimental data with data calculated from the above equation does not and cannot exist. An approximative checking by a comparison of the quantities P_n/P_r (Ref. 1) and ξ_e (Ref. 9) for naphthenate gels of equal composition and similar structure shows that P_n/P_r lies in the range of the maxima P_{nr1} and P_{rr1} between 30 and 50, whereas $\xi_e = 30-35$. In first approximation, the equation may therefore be correct also in the range of destruction; however, this need not hold for all systems. There are 1 figure and 9 references: 5 Soviet-bloc and 7 non-Soviet-bloc. ✓

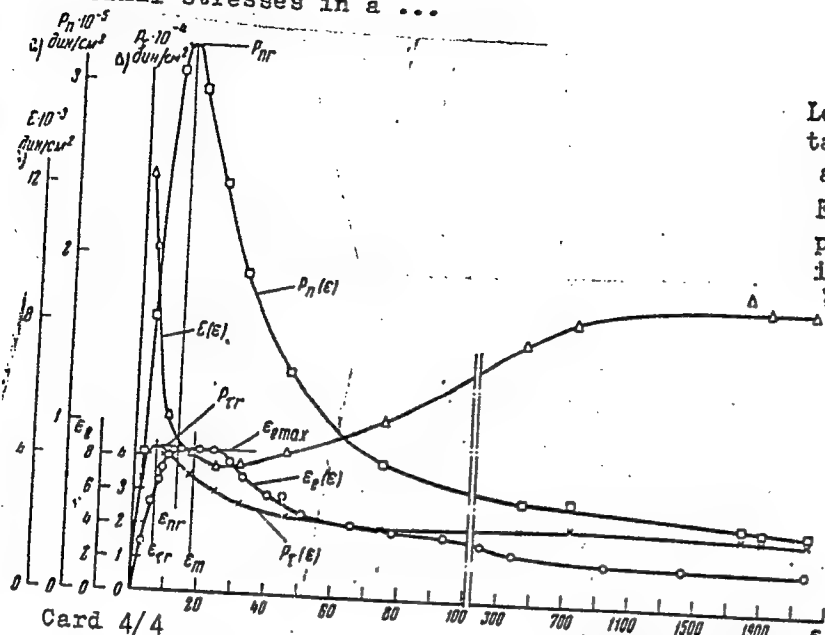
ASSOCIATION: Institut fizicheskoy khimii AN SSSR, Moskva (Institute of Physical Chemistry, AS USSR, Moscow)

SUBMITTED: December 25, 1960

Card 3/4

Normal stresses in a ...

S/069/61/023/001/009/009
B124/204



Legend to Fig. 1: Experimental $P_T(t)$ and $\epsilon_e(t)$ curves, and calculated $P_n(t)$ and $E = P_T/\epsilon_e$ curves for a 20% polyisobutylene solution in o-xylene solution at $\dot{\epsilon} = 294 \text{ sec}^{-1}$. a) dyne/cm²

Fig. 1

TRAPEZNIKOV, A.A.

Effect of octyl alcohol and polyisobutylene additions on elastic recoil and structural strength of aluminum naphthenate gel during its ripening and aging. Koll.zhur. 23 no.5:626-631 S-0 '61. (MIRA 14:9)

1. Institut fizicheskoy khimii AN SSSR, Moskva.
(Aluminum salts)

ZATSEPINA, T.I.; TRAPEZNIKOV, A.A.

Strength, elastic and thixotropic properties of concentrated aluminum
naphthenate gels and the effect on them of polar addends. Koll.zhur.
23 no.6:690-698 N-D '61. (MIRA 14:12)

1. Institut fizicheskoy khimii AN SSSR, Moskva.
(Naphthenic acid) (Colloids)

TRAPEZNIKOV, A.A.; OGAREV, V.A.

Alcohol monolayers for evaporation reduction from the surface
of water and apparatus for measuring two-dimensional pressure
of monolayers. Trudy GGI no.91:14-32 '61. (MIRA 14:8)

(Evaporation)

(Films(Chemistry))

(Hexadecanol)

PETROV, A.D.; TRAPEZNIKOV, A.A.; NIKISHIN, G.I.; OGAREV, V.A.

Alcohols and the properties of their monomolecular layers in
protecting reservoir water from evaporation. Dokl. AN SSSR 138
no.6:1395-1398 Je '61. (MIRA 14:6)

1. Institut organicheskoy khimii AN SSSR i Institut fizicheskoy
khimii AN SSSR. 2. Chlen-korrespondent AN SSSR (for Petrov).
(Alcohols) (Water-storage) (Evaporation)

CHUPEYEV, M.A.; TRAPEZNIKOV, A.A.

Apparatus for testing the strength of paste-like paint materials
and its use in evaluating the dispersing process. Lakokras.mat.i
ikh prim. no.1:67-71 '62. (MIRA 15:4)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut
lakokrasochnoy promyshlennosti i Institut fizicheskoy khimii AN
SSSR.

(Paint materials)

S/120/62/060/003/036/048
E039/E135

AUTHORS: Morozov, A.S., Petrzhik, G.G., and Trapeznikov, A.A.

TITLE: Rheogoniometer with freely suspended discs and continuous recording for structured colloidal systems and polymer solutions

PERIODICAL: Pribery i tekhnika eksperimenta, no.3, 1962, 153-157

TEXT: A rheogoniometer for the investigation of normal and tangential forces in colloidal systems and polymer solutions with their deformation is described. The apparatus consists of a normal goniometer arrangement with a space for the investigation of deformations between a rotating cone and disc. Angles between cone and disc for two interchangeable cones are $3^{\circ} 55'$ and $1^{\circ} 52' 30''$. The cones are truncated by 0.04 mm. Results are given for a 2% solution of aluminium naphthalate in vaseline grease. An oscillogram trace shows the simultaneous growth in time of the normal force acting along the axis of the rotating cone and the value of the torsional moment of the displacement force. Measurement of the dependence of the value of the normal force on radius of the filled part of the cone space showed that

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✓

Rheogoniometer with freely ...

S/120/62/000/003/036/048
E039/E135

$$F_G = 1/2 P_G \pi r^2$$

where P_G is the normal force per unit length at radius r .
A capacity pickup is used to obtain signals showing the growth
of the deformation process from a condition of rest to uniform
flow. The influence of non-parallel axes for the discs and
cones is investigated for various values of clearance between
them.

There are 7 figures.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR
(Institute of Physical Chemistry, AS USSR)

SUBMITTED: September 12, 1961

Card 2/2

33541

S/069/62/024/001/003/003

B119/B101

1583

11.9400
AUTHORS:

Trapeznikov, A. A., Shchegolev, G. G.

TITLE:

Effect of cooling conditions of a consistent lithium grease on its properties and microstructure

PERIODICAL:

Kolloidnyy zhurnal, v. 24, no. 1, 1962, 104 - 112

TEXT: Lubricating grease was produced from nonpolar vaseline oil (for medical use) and Li stearate (from TY MXH 2060-49 (TU MKhP 2060-49) stearic acid and lithium hydroxide) (vaseline oil + 10% Li stearate were mixed and heated to 230°C until attaining the isotropic state), cooled down from 230°C at various rates to various temperatures t_1 , kept at the respective t_1 for 0.5 or 6 hr, and then quickly cooled down to 0°C. The cooling rates to t_1 from 40, 85, 130, 180°C were 54, 33.5, 23, 15.5 deg/min. In another test series, the cooling rate was 1 deg/min, the holding time at t_1 two hours, the further cooling being performed with CO₂ snow in alcohol. The tempera-

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33541

S/069/62/024/001/003/003
B119/B101

Effect of cooling conditions ...

tures were measured with thermocouple and ЭНН -09 (EPP-09) electron potentiometer. Investigations conducted on the specimens: determination of the shearing strength, the syneretic properties (amount of oil squeezed out of the grease; 2 and 0.4 kg plungers, КСА (KSA) apparatus), electron microscopic study of the Li soap structure. Results: Within the temperature range investigated, the curves for the shearing strength and the amount of oil squeezed out are antibatic both with quick and slow cooling to t_1 . With quick cooling, these curves show maxima at $t_1 = 85^\circ\text{C}$ and 170°C (oil amount squeezed out $\sim 47\%$, and $\sim 36\%$, respectively, with 2 kg plunger), and minima (shearing strength $\sim 18 \text{ g/cm}^2$). A minimum of squeezed-out oil at $t_1 = 130^\circ\text{C}$ corresponds to a maximum of shearing strength. With slow cooling, the curves have a descending (squeezed-out oil) and an ascending course (strength). Specimens cooled quickly to $t_1 = 130 - 160^\circ\text{C}$ separate oil automatically. ✓

This "natural syneresis" is explained by the contraction of the structural network of the soap at the precrystalline stage, which takes place without

Card 2/3

33541

S/069/62/024/001/003/003
B119/B101

Effect of cooling conditions ...

destroying the existing network. Electron microscopic studies conducted by the authors together with I. I. Astakhov (Ref. 11: Izv. AN SSSR. Seriya fiz. 23, 6, 777, 1959) yielded: With quick cooling, the submicrostructure of the Li stearate depends largely on t_1 and is more varied than under slow cooling conditions. The greater part of data given in this paper were published at the IV Vsesoyuznaya konferentsiya po kolloidnoy khimii (IV All-Union Conference on Colloid Chemistry) in Tbilisi, May 1958. There are 9 figures, 1 table, and 12 references: 8 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: D. Evans, J. F. Hutton, J. B. Matthews, J. Appl. Chem. 2, 5, 252, 1952; W. J. Vold, J. Phys. Chem. 60, 4, 439, 1956; T. M. Doscher, R. D. Vold, J. Amer. Oil. Chem. Soc. 26, 515, 1949; B. B. Farrington, R. L. Humphreys, Industr. and Eng. Chem. 31, 230, 1939.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR Moskva (Institute of Physical Chemistry of the AS USSR Moscow)

SUBMITTED: December 25, 1960

Card 3/3

OGAREV, V.A.; TRAPEZNIKOV, A.A.

Apparatus for measuring the surface tension of liquids at the
interface of a gas phase in the case of large surfaces. Zav.lab.
28 no.7:881-883 '62 (MIRA 15:6)

1. Institut fizicheskoy khimii AN SSSR.
(Surface tension)

S/076/62/036/012/002/014
B101/B180

AUTHORS: Ogarev, V. A., and Trapeznikov, A. A. (Moscow)

TITLE: Determination of the molecular weight of polymers by the monolayer method

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 12, 1962, 2644 - 2652

TEXT: The molecular weights of hydroquinone polyesters of phenyl phosphinic, methyl phosphinic, and phenoxy phosphinic acids were determined by the monolayer method. The molecular weight determined viscosimetrically was ~12,000. The curves F versus a and a versus F were plotted, F being the surface pressure and a the area. The course of these curves was found to depend on the amount and concentration of the polyester solution applied to the water surface. Owing to the association of molecules the molecular weight calculated from these curves was found to increase with the amount and concentration of the polymer solution. The values are affected by molecular interactions of the polymers in the monolayer, even with very low concentrations (0.01045%) and amounts (0.00059 mg). This means that considerably care is needed for this method. There are 4 figures and 4
Card 1/2

Determination of the molecular ...

S/076/62/036/012/002/014
B101/B180

tables.. The most important English-language references are: H. B. Bull, Advances Protein Chem., 3, 95, 1946; H. B. Bull, J. Biol. Chem., 185, 27, 1950.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii (Academy of Sciences USSR, Institute of Physical Chemistry)

SUBMITTED: March 29, 1961

Card 2/2

S/020/62/147/002/020/021
B101/B186

AUTHORS: Trapeznikov, A. A., Chupeyev, M. A.

TITLE: Pentaphthalic resins as surface-active peptizers of carbon black

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 147, no. 2, 1962, 422-425

TEXT: To determine a convenient ratio between pigment and vehicle in the milling process and to increase the output of carbon black roller mills, the effect of some film-forming substances on the milling of carbon black in nonpolar media (white vaseline oil, white spirit) was investigated, and the structural strength P_t of the paste as well as its dispersity were determined. ПФН-3 (PFL-3) pentaphthalic resin dissolved in white spirit (dry varnish residue 52.6%), and ПФН-03 (PFL-03), soluble in vaseline oil, were used as film formers. The ratio carbon black : liquid phase was kept constant. Results: (1) P_t increased with increasing PFL-3 concentration, passed a maximum (~ 20 g/cm²) at 20-22% varnish content, then dropped strongly at 30-40% varnish content. PFL-03 behaved similarly. (2) With increasing time of milling (3-25 min), $P_{t \max}$ decreased and shifted toward higher varnish

Card 1/3

Pentaphthalic resins as...

S/020/62/147/002/020/021
B101/B186

contents. (3) Maximum dispersity occurred under the same conditions as $P_{\epsilon \max}$. (4) The varnish concentration of $P_{\epsilon \max}$ is a linear function of the liquid-phase content in the paste. (5) More "fatty" (long-oil) resins and thickened linseed oil have smaller consolidating and peptizing effects than pentaphthalic resins since they contain fewer polar groups, but they do not cause flocculation. Conclusions: The resin is adsorbed to carbon black; at low varnish content, however, part of the carbon black surface is not blocked and can form network structures. At high varnish content, the carbon black particles are fully blocked, and P_{ϵ} drops. At 150-300% varnish content the pentaphthalic resin reacts with resin adsorbed to carbon black, thus initiating flocculation. The usual formulas for carbon black pastes prescribe too high a content of film formers (250-450% by weight of carbon black). The output of roller mills can be increased by reducing the varnish admixture and increasing the carbon black content in the paste to be milled. There are 4 figures and 1 table.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR);
Gosudarstvennyy proyektnyy i issledovatel'skiy institut (State Design and Planning and Research Institute)

Card 2/3

Pentaphthalic resins as...

S/020/62/147/002/020/021
B101/B186

PRESENTED: July 6, 1962, by S. M. Vol'fkovich, Academician

SUBMITTED: July 3, 1962

Card 3/3

ACC NR: AP6022448

(A)

SOURCE CODE: UR/0069/66/028/002/0309/0312

AUTHOR: Shchegolev, G. G.; Trapeznikov, A. A.

ORG: Institute of Physical Chemistry, AN SSSR, Moscow (Institut fizicheskoy khimii AN SSSR)

TITLE: The influence of alkali content on the microstructure and properties of lithium greases²⁷

SOURCE: Kolloidnyy zhurnal, v. 28, no. 2, 1966, 308-312

TOPIC TAGS: grease, alkali, lithium compound, lubricant property, lubricant additive

ABSTRACT: The report describes experiments carried out to clarify the influence of LiOH concentration and of crystallization temperature program t_1 on shear strength P_r and syneresis factor S in lithium stearate + nonpolar paraffin oil (I) and lithium stearate + oil MVP (II). Alkali concentration was varied in I from 0 to 0.2 mol/mol soap at $t_1=70^\circ\text{C}$ const, and in II from 0 to 0.12 mol/mol soap at $t_1=100^\circ\text{C}$ const; it was maintained constant at 0.02 mol/mol in system I during another series, while t_1 was varied from 70 to 170°C . Results indicate a relatively congruent pattern of variation of P_r and S in relation to t_1 for rapidly cooled greases, with or without LiOH added. Electron microscopy indicates that addition of alkali reduces linear dimensions (particularly the thickness) of inceptive soap particles, hence increases the number of fine pores in the grease structure and impairs syneresis of oil from the grease.

UDC: 541.18.02

Cord 1/2

ACC NR: AP6022448

Effects of alkali concentration on slowly cooled greases are explained in terms of modifications to growth patterns of lithium stearate crystallites. Orig. art. has: 5 figures.

SUB CODE: 07,11/ SUBM DATE: 27Oct64/ ORIG REF: 006/ OTH REF: 001

Card 2/2

TRAPEZNIKOV, A.A.; PETRZHIK, G.G.

Electroconductivity of nonaqueous colloid systems. Solutions and thixotropic gels of alkyd resins. Koll.zhur. 27 no.3:453-458 My-Je '65.

Electroconductivity of nonaqueous colloid systems. Dispersions of a thixotropic binder based on the alkyd resin modified by polyamide resin in a flow. Ibid.:459-464 (MIRA 18:12)

1. Institut fizicheskoy khimii AN SSSR, Moskva. Submitted Nov. 29, 1963.

L 18010-66 EWT(m)/EWP(v)/EWP(j)/T DS/vw/RM
ACC NR: KP6004316 SOURCE CODE: UR/0303/65/000/005/0031/0035

AUTHOR: Shchipanova, Ye. P.; Trapeznikov, A. A.

ORG: none

TITLE: Preparation of a thixotropic binder by combining alkyd and polyamide resins in a solvent medium

SOURCE: Lakokrasochnyye materialy i ikh primeneniye, no. 5, 1965, 31-35

TOPIC TAGS: resin, polyamide

ABSTRACT: The combination of glyptal and pentaphthalic resins with polyamides of various chemical compositions in a solvent was studied at various temperatures, and a method was thus worked out for preparing a thixotropic binder or gelkyd (a 50% dispersion containing 3.5% polyamide) from an alkyd resin and polyamide. It was noted that free phthalic anhydride present in alkyd resins and acting as a peptizer of the gelkyd structure, had an adverse effect on the properties of gelkyds synthesized in a white spirit medium. The influence of the duration and method of combination of the alkyd and polyamide resins on the rate of thixotropic recovery and on the

UDC: 667.633.263.3

Card 1/2

L 18010-66
ACC NR: AP6004316

strength during the initial and final stages of the recovery of structure was determined. The properties of gelkyds obtained by fusion and by combination in a solvent were compared, and the latter method was found to yield more reliable and reproducible results. Orig. art. has: 7 figures, 4 tables.

SUB CODE: 11/ SUBM DATE: 00/ ORIG REF: 007/ OTH REF: 005

Card 2/2 7795

SHCHEGOLEV, G.G.; TRAPEZNIKOV, A.A.; ASTAKHOV, I.I.

Colloidal and chemical characteristics and microstructure of lithium
lubricating greases. Khim. i tekhn. topl. i masel 10 no.8:48-55 Ag
'65. (MIRA 18:9)

1. Institut fizicheskoy khimii AN SSSR.

L 01012-66 ENT(m)/EPF(c)/T DJ

ACCESSION NR: AP5019984

UR/0055/65/000/008/0048/0055
621.892.5

AUTHOR: ^{44,55}Shchegolev, G. G.; ^{44,55}Trapeznikov, A. A.; ^{44,55}Astakhov, I. I.

TITLE: Colloidal-chemical properties and microstructure of lithium lubricating greases ^{11, 44, 55}

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 8, 1965, 48-55

TOPIC TAGS: lithium, lubrication, grease, oil/ TsiATIM grease, MVP oil

ABSTRACT: The effect of cooling conditions on structural strength, pressibility, and shape and size of soap particles in lithium lubricating greases was studied. The effect which sedimentation and mechanical wearing of greases have on their properties was also investigated. In two separate series of tests, various isotropic solutions of soap in oil were slowly and rapidly cooled from the boiling state to the t_1 temperature ($t_1 = 0^\circ - 175^\circ\text{C}$), held at t_1 for various durations, and then rapidly cooled to 0°C . Commercial TsiATIM-201 grease¹¹ was compared against two model systems: 1. lithium stearate-partial vaseline oil,⁵⁵ and 2. lithium stearate-MVP oil. Dependence of structural strength P_n (in g/cm^2) and pressibility S (in %) on t_1 for

Card 1/4

L 01012-66

ACCESSION NR: AP5019984

the case of rapid cooling is shown in fig. 1 of the Enclosure where curves 1 and 2 are for the lithium stearate-partial vaseline oil system, curves 3 and 4 are for the lithium stearate-MVP oil system, and curves 5 and 6 are for digested TsiATIM-201 grease. Dependence of structural strength (in g/cm²) and pressibility (in %) on t_1 for the case of slow cooling is shown in fig. 2 of the Enclosure where curves 1 and 2 are for the lithium stearate-partial vaseline oil system, and curves 3 and 4 are for digested TsiATIM-201. The electron-microscopic examination of the grease framework indicate that the dimension and shape of soap particles closely correlate with soap phase transformations and conditions of soap crystallization. The soap phase transformations and conditions of crystallization are reflected in the structural strength and pressibility of the product grease. During sedimentations at various cooling conditions, the soap microstructure is a function of volume of the dispersed phase. It was found that mechanical wearing of greases is reflected in the cross-sectional view of grease particles and aggregates. Orig. art. has: 5 figures, 1 table.

ASSOCIATION: IFKh AN SSSR ⁴⁴ 55

SUBMITTED: 00

NO REF SOV: 009

ENCL: 02

OTHER: 002

SUB CODE: MT, FP

Card 2/4

L 01012-66

ACCESSION NR: AP5019984

ENCLOSURE: 01

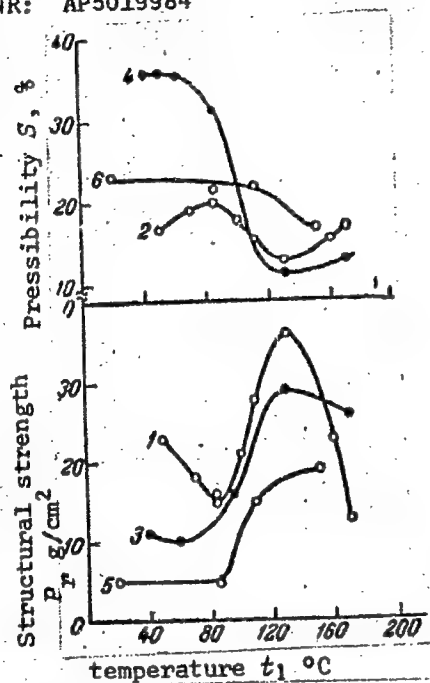


Fig. 1. P_r and S as functions of t_1 for rapidly cooled lubricants: curves 1 and 2--LiSt-partial vaseline oil; curves 3 and 4--LiSt-MVP oil; curves 5 and 6--digested TsIATIM-201 grease.

Card 3/4

L 01012-66

ACCESSION NR: AP5019984

ENCLOSURE: 02

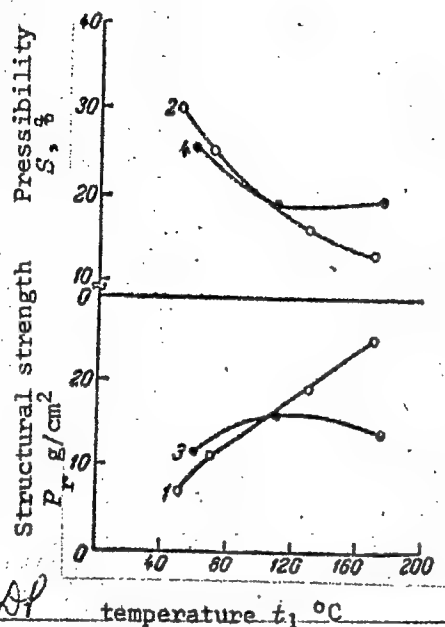


Fig. 2. P_r and S as functions of t_1 for slowly cooled lubricants: curves 1 and 2--LiSt-partial vaseline oil; curves 3 and 4--digested TsIATIM-201 grease.

Card 4/4

AVETISYAN, R.A.; TRAPEZNIKOV, A.A.

New data on the cancellation of waves by monolayers of insoluble substances. Zhur. fiz. khim. 38 no.12:3036-3038 D '64.

(MIRA 18:2)

1. Institut fizicheskoy khimii AN SSSR.

L 59641-85

USSR ACADEMY OF SCIENCES, Institute of Physics, Moscow, U.S.S.R. (Institute of Physics, U.S.S.R.)

"APPROVED FOR RELEASE: 03/20/2001

CIA-RDP86-00513R001756510004-2

NR REF SOV: 012

OTHER: 000

APPROVED FOR RELEASE: 03/20/2001

CIA-RDP86-00513R001756510004-2"

ZOTOVA, K.V.; TRAPEZNIKOV, A.A.

Two-sided films formed from solutions of aerosol MA with
gelatine additions. Koll. zhur. 27 no.2:197-202 Mr-Apr '65.
(MIRA 18:6)

1. Institut fizicheskoy khimii AN SSSR, Moskva.

ACCESSION NR: AP5020221

TOPIC: surface active agent, surface active substance, surface activity, polyamide resin, etc.

ABSTRACT: The mechanism of the thixotropic structure formation in polyamide surface active agent.

Author: Shalonenkina (Kollodnaya, 1979, 300, 1979).
Proposed by: A. A. Trapeznikov and T. G.

Word 1/1

TRAPEZNIKOV, A.A.; OGAREV, V.A.

Monolayers of higher secondary alcohols at the water - air interface.
Zhur. fiz. khim. 39 no.3:722-728 Mr '65. (MIRA 18:7)

1. Institut fizicheskoy khimii AN SSSR.

TRAPEZNIKOV, A.A.

Temperature reversibility of the exchange sorption of copper ions
b, palmitic acid crystals in the phase transition region. Zhur. fiz.
khim. 39 no.2:410-417 F '65. (MIRA 18:4)

1. Institut fizicheskoy khimii AN SSSR.

TRAPEZNIKOV, A.A.; ZATSEPINA, T.I.; GRACHEVA, T.A.; SHCHERBAKOVA, R.N.;
OGAREV, V.A.

Monolayers of polydimethylsiloxane polymers. Rheological properties and microstructure of pastes with fillers. Dokl. AN SSSR 160
no.1:174-177 Ja '65. (MIRA 18:2)

1. Institut fizicheskoy khimii , N SSSR.

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"The structure of two-sided films of detergents, their rheological properties and its relation to the stability of foams."

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